



## Overview

*Qatar is the largest exporter of liquefied natural gas (LNG) in the world, and the country's exports of LNG, crude oil, and petroleum products provide a significant portion of government revenues.*

Like many of its neighbors, Qatar relies on its energy sector to support its economy. According to the Qatar National Bank (QNB), Qatar's earnings from its hydrocarbons sector accounted for 60% of the country's total government revenues over the past five fiscal years (through fiscal year 2012-13). The U.S. Energy Information Administration (EIA) estimates that [Qatar earned \\$55 billion from net oil exports in 2012](#), and QNB estimates that the oil and natural gas sector of Qatar accounted for 57.8% of the country's gross domestic product in 2012.

Qatar was the world's fourth largest dry natural gas producer in 2012 (behind the United States, [Russia](#), and [Iran](#)), and has been the world's leading liquefied natural gas (LNG) exporter since 2006. Qatar is also at the forefront of gas-to-liquids (GTL) production, and the country is home to the world's largest GTL facility. The growth in Qatar's natural gas production, particularly since 2000, has also increased Qatar's total liquids production, as lease condensates, natural gas plant liquids, and other petroleum liquids are a significant (and valuable) byproduct of natural gas production.

Qatar produced nearly 1.6 million barrels per day (bbl/d) of liquid fuels (crude oil, condensates, natural gas plant liquids, gas-to-liquids, and other liquids) in 2013, of which 730,000 bbl/d was crude oil and the remainder was non-crude liquids. While Qatar is a member of the Organization of the Petroleum Exporting Countries (OPEC), the country is the second-smallest crude oil producer among the 12-member group. Natural gas meets the vast majority of Qatar's domestic energy demand, so the country is able to export most of its liquid fuels production. Given its small population, Qatar's energy needs are met almost entirely by domestic sources.

Qatar's fiscal year 2012-13 budget assumed an oil export price of \$65 per barrel, and with

the average export price of the country's Qatar Land export stream averaging nearly \$110 per barrel over that period, the government earned significantly higher revenues than expected.

## Qatar summary energy statistics

### Oil (million barrels)

Proved reserves, 2014 (million barrels)	Total oil supply, 2012 (thousand bbl/d)	Total petroleum consumption, 2012 (thousand bbl/d)	Reserves-to-production ratio
25,240	1,579	190	57

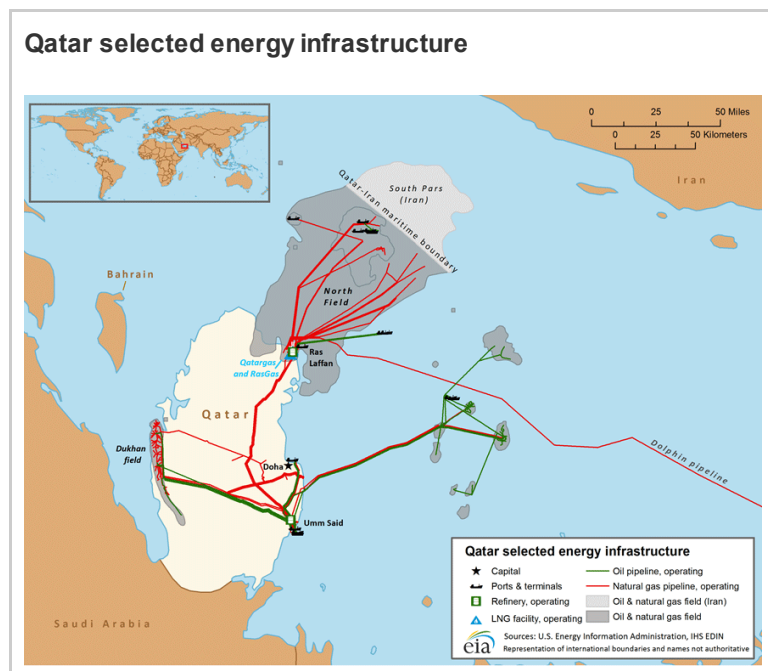
### Natural gas (billion cubic feet)

Proved reserves, 2013	Dry natural gas production, 2012	Dry natural gas consumption, 2012	Reserves-to-production ratio
885,000	5,523	1,257	160

### Electricity

Generating capacity, 2011 (gigawatts)	Electricity generation, 2011 (billion kilowatthours)	Electricity consumption, 2010 (billion kilowatthours)	Distribution losses, 2010 (billion kilowatthours)
7.8	32.3	20.5	1.8

Source: U.S. Energy Information Administration, *International Energy Statistics*, *Oil & Gas Journal*



## Sector organization

The state-owned Qatar Petroleum (QP) controls all aspects of Qatar's upstream and downstream oil and natural gas sectors, including exploration, production, transport, storage, marketing, and sale of crude oil, natural gas, natural gas liquids, liquefied natural gas, gas-to-liquids (GTL), refined products, and petrochemicals and fertilizers.

Qatar often focuses its natural gas development on integrated large-scale projects linked to LNG exports or downstream industries that use natural gas as a feedstock. These projects tend to include investment from international oil companies (IOCs) with the technology and expertise in integrated mega-projects, including ExxonMobil, Shell, and Total. The Qatargas Operating Company Limited (Qatargas), which operates four major LNG ventures (Qatargas I-IV), and Ras Laffan Company Limited (RasGas), which operates three major LNG ventures (RasGas I-III), lead Qatar's LNG sector. Each venture has an individual ownership structure, although QP owns at least 65% of each.

The Qatargas consortium includes QP, Total, ExxonMobil, Mitsui, Marubeni, ConocoPhillips, and Shell, while RasGas is 70% owned by QP and 30% owned by ExxonMobil. The two LNG companies handle all upstream to downstream natural gas transportation themselves, while the Qatar Gas Transport Company (known as Nakilat) is responsible for shipping Qatar's LNG.

In the oil sector, while QP owns and operates the onshore Dukhan field and the offshore Maydan Mahzam and Bul Hanine fields, IOCs operate the remaining offshore fields via production sharing agreements (PSAs). In an effort to increase production and reserves and to mitigate natural gas-related capital expenditures, QP offered more favorable terms for PSAs in recent years. Today, more than half of Qatar's oil production comes from foreign oil companies via PSAs. However, Qatar recently began moving toward using more joint-venture (JV) agreements, which tend to offer higher returns to the state.

Qatar's electricity sector has several important entities, including the Qatar Electricity and Water Company (QEWCo), which owns and manages the country's electric and desalinization plants. The Qatar General Electricity & Water Corporation owns and operates the country's electricity and water distribution networks.

### Selected Qatar Petroleum subsidiaries, joint ventures, and investments

Name	Comment
Alwaseeta	Identifies, invests in, builds, and develops intermediate and downstream industrial projects
Gasal	Provides industrial gases such as oxygen, nitrogen, hydrogen, and argon to the steel, oil, gas and chemical downstream industries in Qatar

Laffan Refinery	Condensate refinery
Oryx GTL	Developed, constructed, and operates large gas-to-liquids (GTL) facility
Pearl GTL	World's largest GTL facility
Qatar Fuel Additives Company	Produces methanol and MTBE for both local and global markets
Qatar Petrochemical Company (QPI)	First petrochemical company in the Middle East (1974)
Qatar Petroleum International	Invests in upstream, gas and power, refining/petrochemicals, and other midstream/downstream activities
Qatar International Petroleum Marketing Company (Tasweeq)	Responsible for overseas marketing of refined products, condensates, liquefied petroleum gases, and sulfur

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Sources: Qatar Petroleum, Alwaseeta, Gasal, QPI

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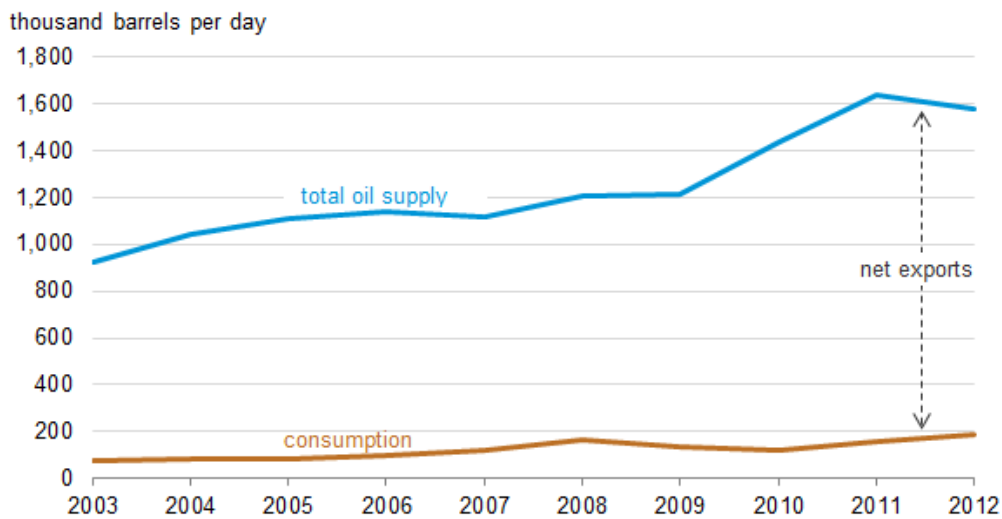
## Oil

*Qatar's crude oil production is the second lowest in the Organization of the Petroleum Exporting Countries (OPEC), but increasing production of non-crude liquids—most of which is a byproduct of natural gas production—is contributing to gradual growth in total liquids production.*

Qatar has been a member of OPEC since 1961. With proved reserves of crude oil estimated at 25.2 billion barrels by the *Oil & Gas Journal* (as of January 2014), Qatar holds the 9th largest reserves in OPEC and 13th largest in the world. Qatar's crude oil and lease condensate production ranks 19th in the world, with most of the country's production sent abroad as exports.

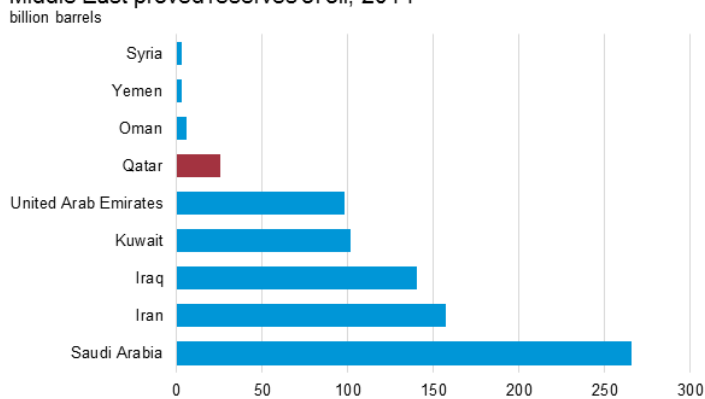
In 2012, Qatar's non-crude liquids production surpassed its crude oil production for the first time in the country's history. Recent growth in non-crude liquids is the result of the country's robust natural gas production, which produces many heavier hydrocarbons in addition to natural gas. With high levels of natural gas production expected to continue, Qatar's non-crude liquids supply is also likely to remain high.

## Qatar total oil supply and total petroleum consumption, 2003-2012



Source: U.S. Energy Information Administration, *International Energy Statistics*

### Middle East proved reserves of oil, 2014



Source: U.S. Energy Information Administration, *International Energy Statistics, Oil & Gas Journal*

## Exploration and production

*Three oil fields account for more than 85% of Qatar's crude oil production capacity.*

Oil exploration activity in Qatar is ongoing, although not to the degree seen in other oil producing countries. The last major discovery in Qatar came in 1994 (the Al Rayyan field), and any supply growth in the near term is likely to come from increased output at Qatar's existing fields, particularly through the use of enhanced oil recovery (EOR) techniques. Operators have used EOR techniques in several fields, including Al-Shaheen, Dukhan, Bu Hanine, and Maydan Marjam. Qatar's oil production comes from just a few fields, led by the Al Shaheen, Dukhan, and Idd al-Shargi, which combined, account for more than 85% of the country's crude oil production capacity.

Qatar's total liquids production, which includes crude oil, condensates, natural gas plant liquids, and other liquids, was 1.6 million bbl/d in 2012, a slight decline from 2011 but up by more than 70% since 2003. Qatar produced over 1.2 million barrels per day (bbl/d) of crude oil and condensates in 2012, according to EIA estimates.

The Qatar National Bank (QNB) expects Qatar's crude oil production levels to reach 800,000 bbl/d by 2017 as Qatar Petroleum's \$6.6 billion development plan (2010-2014) for crude oil projects continues. A previous government crude oil production capacity target of 1.2 million bbl/d no longer appears feasible, although investment from IOCs could also help boost, or at least maintain, crude oil production levels.

Qatar's non-crude liquids production has grown significantly over the past several years largely as a result of increased natural gas production in the country. EIA estimates that non-crude liquids production accounted for over half of Qatar's total oil supply in 2012, which EIA expects to continue in the short- and medium-term. Based on statements from government officials, some industry sources believe Qatar's condensate production could surpass 800,000 bbl/d by 2015 and reach nearly 1 million bbl/d by 2016. QNB reported in August 2013 that Qatar held condensate reserves of more than 22 billion barrels, although it is unclear under what economic and technological conditions those reserves would be considered economically viable.

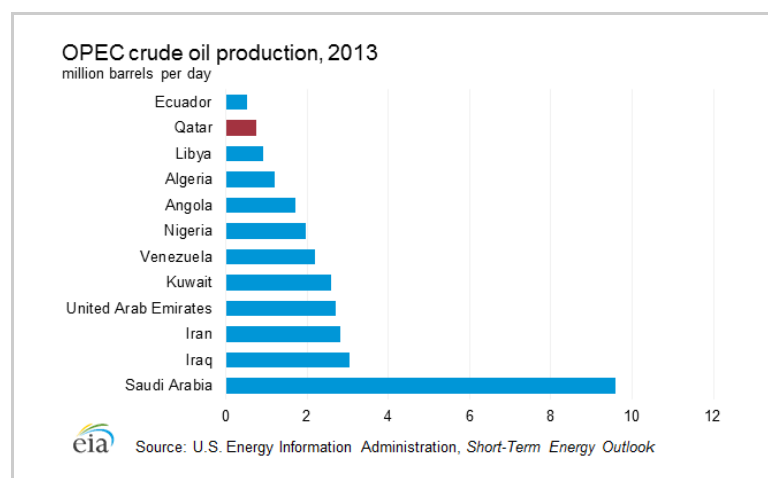
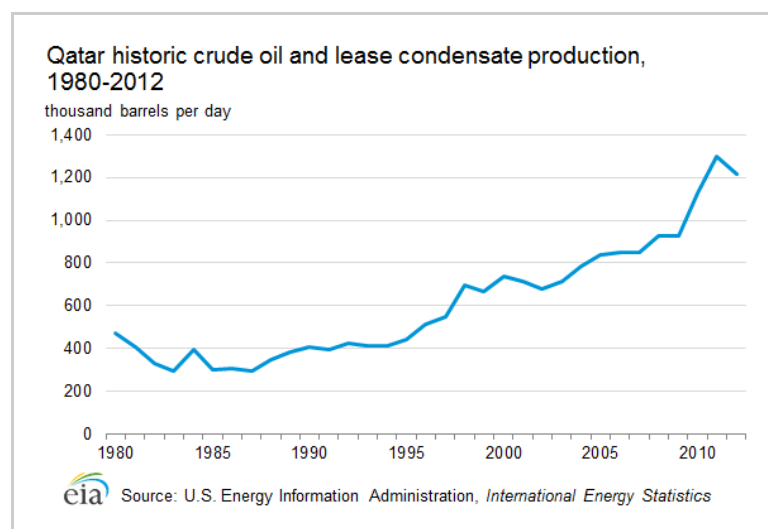
### Qatar effective crude oil production capacity, 2013

Field	Capacity (thousand barrels per day)	Primary operator	Comments
Al Shaheen	300	Maersk	Maersk began work on \$2.5 billion drilling program in 2013 to maintain output at 300,000 bbl/d
Dukhan	225	Qatar Petroleum	ExxonMobil-led development plan likely to conclude in 2014
Idd al-Shargi	100	Occidental	Occidental Petroleum investing \$3 billion to maintain production of 100,000 bbl/d through use of enhanced oil recovery techniques
Bul Hanine	45	Qatar Petroleum	Total to invest \$6 billion to double capacity to 90,000 bbl/d by 2017
Maydan Mahzam	22	Qatar Petroleum	--
Al-Kahaleej	19	Total	--
Al Rayyan	8	Occidental	--
Al-Karkara	7	Qatar Petroleum Development	--

		Company	
El-Bunduq	6.5	Bunduq Oil Company	Operated jointly with United Arab Emirates
total	732.5		

*Note: These totals may not reflect non-crude liquids production capacity for these fields.*

*Source: Middle East Economic Survey, U.S. Energy Information Administration*



## Imports and exports

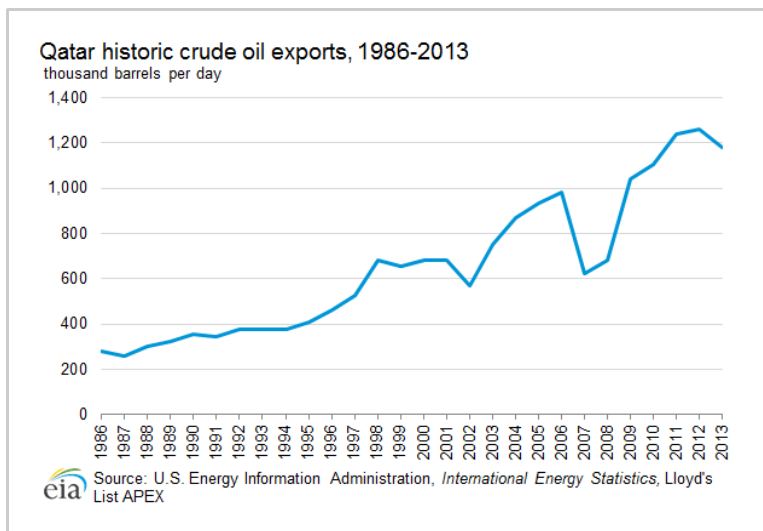
*Qatar was the second-smallest crude oil exporter among OPEC members in 2012, ahead of only Ecuador.*

Qatar does not import any crude oil and only occasionally imports petroleum products, since the country's production and refining sectors more than meet domestic demand. In fact, because Qatar's natural gas meets so much of Qatar's energy demand, the country exports most of its crude oil and petroleum product production. Qatar exports petroleum and

petroleum products from three major export terminals: Umm Said (Mesaieed), Halul Island, and Ras Laffan. QP's offshore pipeline network brings crude oil from offshore oil fields to Halul Island where oil can be processed for export. Onshore, most oil is sent to the Mesaieed (Umm Said) terminal for refining or export.

According to the *OPEC Annual Statistical Bulletin 2013*, Qatar exported 588,000 bbl/d of crude oil and 464,600 bbl/d of refined petroleum products in 2012. In 2012, Qatar sent nearly all of its crude oil to Asian markets and the majority (86%) of its refined product exports to Asian countries, according to OPEC estimates. Most of Qatar's refined products (60% or more) go to [Japan](#).

Qatar has three main crude streams: the Qatar Land, Qatar Marine, and Al Shaheen. The Qatar Land and Qatar Marine blends are both lighter crudes, while the Al Shaheen is slightly heavier. The Qatar Marine and Al Shaheen streams have high sulfur content, while the Qatar Land's sulfur content is slightly lower.



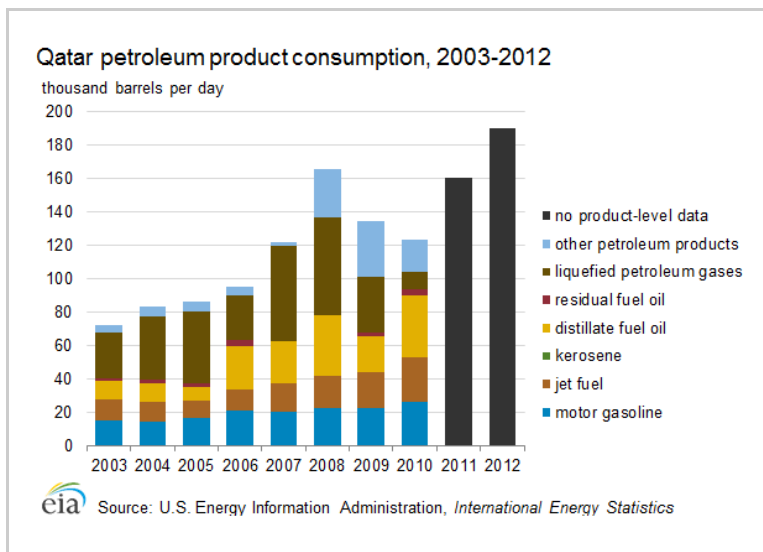
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## Refining and consumption

*Qatar's refining capacity exceeds domestic demand for petroleum products, thus enabling the country to export most of its refinery output.*

Petroleum consumption in Qatar rose by more than 70% from 72,000 bbl/d in 2003 to 189,700 bbl/d in 2012. Qatar has two operating refineries with a combined crude oil refining capacity of 338,700 bbl/d according to the Oil & Gas Journal, and the combined output is more than enough to meet Qatar's domestic demand. That surplus output enables Qatar to export refined products, and both refineries are near major oil export terminals, one at Umm Said and the other at Ras Laffan. There are plans to double the refining capacity at Ras Laffan to handle more condensates from the country's natural gas fields by 2016, when the Phase II expansion at Ras Laffan begins operations.





## Natural gas

*Natural gas is at the center of Qatar's energy sector. Already the world's largest exporter of liquefied natural gas (LNG), several recent developments in the country's natural gas sector could boost production in the short term.*

As of January 2014, Qatar had the third-largest proved reserves of natural gas in the world at 885 trillion cubic feet (Tcf), according to the *Oil & Gas Journal*. Nearly all of Qatar's reserves are in the country's North Field, which is part of the world's largest natural gas deposit. Iran's South Pars and Qatar's North Field together comprise the entire deposit.

There is currently a moratorium on new projects in Qatar's massive North Field while operators continue to examine ways of sustaining high levels of output over the longer term. The moratorium, initially scheduled to end in 2008, will run through at least 2015 after several extensions. Nevertheless, growth from other fields and new projects could result in overall output growth, although likely at low levels.

Qatar spent many years developing its natural gas resources—particularly in the North Field—and in 2012, Qatar was the second-largest dry natural gas producer in the Middle East and the fourth-largest producer in the world. With its relatively low domestic energy demand, Qatar is able to export nearly all of its natural gas production. As such, Qatar has been the world's leading exporter of LNG since 2006, and is a member of the Gas Exporting Countries Forum (GECF).

Qatar's growing natural gas production has increased its output of condensates and natural gas plant liquids, which are valuable byproducts of natural gas production. Qatar is also at the forefront of gas-to-liquids (GTL) technology, which processes natural gas into heavier hydrocarbons, such as distillates and naphtha.

## Top 10 countries with proved natural gas reserves, 2014

Country	trillion cubic feet
Russia	1,688
Iran	1,193
Qatar	885
United States	334*
Saudi Arabia	291
Turkmenistan	265
United Arab Emirates	215
Venezuela	196
Nigeria	181
Algeria	159

\*2012 data

Source: U.S. Energy Information Administration,  
International Energy Statistics, Oil & Gas Journal

## Exploration and production

*Nearly all of Qatar's natural gas production comes from the North Field, which is part of the largest non-associated natural gas field in the world.*

Qatar's dry natural gas production reached 5.5 Tcf in 2012, up from just 1.1 Tcf ten years earlier. The vast majority of Qatar's production comes from the North Field, although some smaller fields contribute production volumes as well.

The \$10.4 billion Barzan Gas Project should boost Qatar's natural gas production from the North Field in the near term. The project consists of both onshore and offshore developments, including offshore platforms, pipelines, and a gas processing unit. Announcements by government officials and ExxonMobil indicate that the project—which began in 2011—will begin operations in 2014 and be capable of processing 1.4 Bcf/d of natural gas.

While nobody expects another discovery like that of the North Field in 1971, exploration in Qatar may still uncover commercially viable natural gas resources. In May 2013, QP and Wintershall announced the discovery of natural gas in Block 4 (North) off the coast of Qatar. The discovery may contain more than 2.5 Tcf in recoverable reserves, and Wintershall expects production of between 200 and 400 million cubic feet per day (MMcf/d).

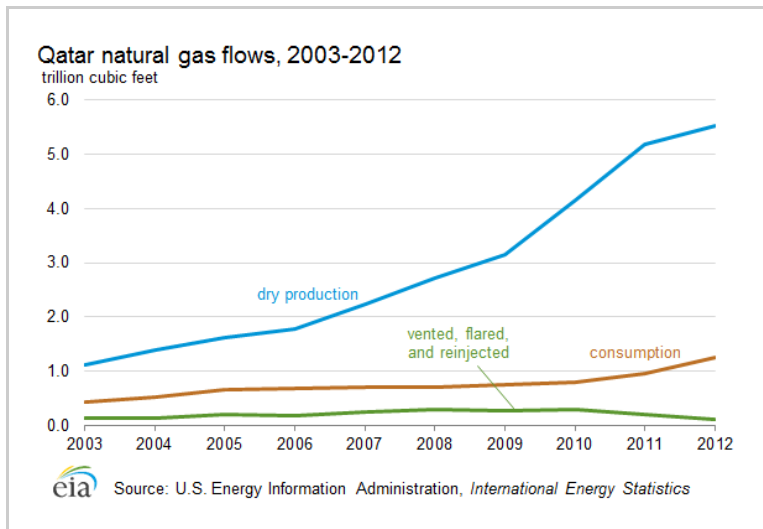
## Gas-to-liquids

Qatar is a global leader in gas-to-liquids (GTL) technologies, and the country has two

operational facilities. GTL technology uses a refining process to turn dry natural gas into liquid fuels such as low-sulfur diesel and naphtha, among other products. Qatar is one of only three countries—with [South Africa](#) and [Malaysia](#) being the others—to have operational GTL facilities, although pilot projects in a number of other countries are underway.

Qatar's Oryx GTL plant (QP 51%, Sasol-Chevron GTL 49%) came online in 2007, but due to initial problems, it was not fully operational until early 2009. At full capacity, the Oryx project uses about 330 MMcf/d of natural gas feedstock from the Al Khaleej field to produce 30,000 bbl/d of GTL products. Officials have discussed a 100,000 bbl/d expansion of the Oryx facility in the event Qatar lifts the moratorium on North Field developments.

The Pearl GTL project (QP 51%, Shell 49%) uses 1.6 Bcf/d of natural gas feedstock to produce 140,000 bbl/d of GTL products as well as 120,000 bbl/d of natural gas liquids and liquefied petroleum gases (LPG). The plant's initial phase commenced in early 2011, and the first shipments of gasoil were sent out in June 2011. After initiating the second phase of development, Pearl GTL achieved full capacity in October 2012. In addition to being the largest GTL plant in the world, the Pearl GTL project is also the first integrated GTL operation, meaning it will have upstream natural gas production integrated with the onshore conversion plant.



## Consumption

*Qatar's natural gas consumption continues to rise as the country's overall energy demand rises along with its economy.*

Qatar meets all of its internal natural gas demand from domestic sources. Natural gas consumption has grown quickly over the past several years, nearly tripling between 2003 and 2012. This tracks closely with overall natural gas production, which more than quadrupled over the same period. In 2012, consumption reached 1.3 Bcf/d, growing 30% from the 2011 level. The electricity and water (desalinization) sectors account for most of the

natural gas consumption in Qatar.

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## Exports

*Qatar exports nearly 85% of its natural gas as liquefied natural gas (LNG), and it has been the largest exporter of LNG in the world since 2006.*

Qatar is the world's second-largest exporter of natural gas, exporting nearly 4.3 Tcf in 2012, and the country was again the world's largest LNG exporter, as it has been since 2006. Most of Qatar's exports go to markets in Asia in the form of LNG, while the country sends a small amount of natural gas via the Dolphin Pipeline to the [United Arab Emirates \(UAE\)](#) and [Oman](#).

Qatar's LNG export capacity is the highest in the world at 77 million tons per year (MMt/y), approximately 3.7 Tcf, split between Qatargas (42 MMt/y) and RasGas (35 MMt/y). The companies added 5 of the country's 14 trains in 2009 and 2010. The latest, the 14th train (Qatargas IV Train 7), came online in January 2011 with a capacity of 380 Bcf/y (7.8 MMt).

Historically, most of Qatar's LNG exports were part of long-term, oil-indexed contracts, but over the past few years the country began to shift to more short-term contracts and spot-market sales. In 2012, Qatar exported over one quarter of its LNG as short-term or spot-market sales (19.9 MMt according to QNB), accounting for more than a third of short-term and spot-market sales in the world.

Several recent agreements between Qatargas and international LNG importers are of the short-term variety, including a deal based on continental European prices rather than oil-indexation for the first time in the company's history.

Qatar has over 90% of its LNG production volumes committed as part of supply purchase arrangements (SPAs) between 2014 and 2020. LNG production growth elsewhere in the world over the next few years may challenge some of Qatar's remaining spot volumes, although with the majority of its LNG already sold, the impact on Qatar's natural gas exports should be limited in the near term.

The Dolphin Pipeline—which currently has a capacity of approximately 2 Bcf/d—transported 1.9 Bcf/d in 2012 according to Dolphin Energy Limited (DEL), which operates the pipeline. UAE received approximately 1.7 Bcf/d in 2012, while the remainder (approximately 200 MMcf/d) went to Oman. DEL plans to expand capacity of the pipeline to 3.2 Bcf/d, full design capacity, in 2015.

## Top 10 global natural gas exporters, 2012

Country	trillion cubic feet
Russia	7.4
Qatar	4.3

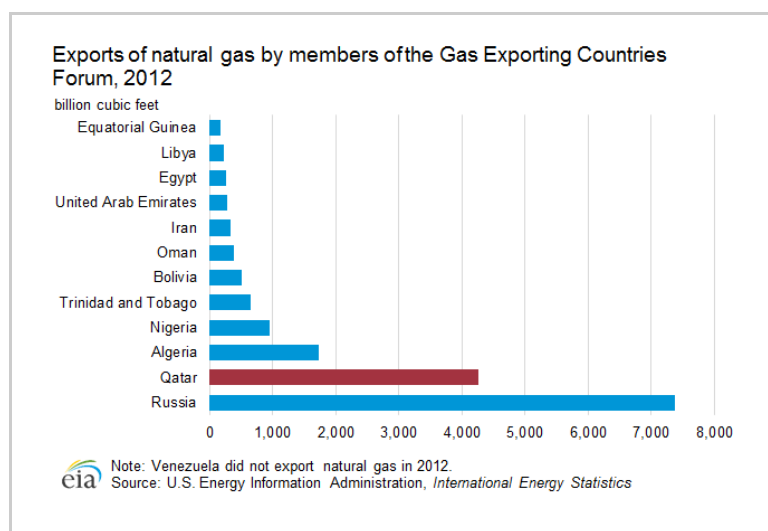
Norway	3.8
Canada	3.1
Netherlands	2.1
Algeria	1.7
Turkmenistan	1.6
United States	1.6
Indonesia	1.2
Austria	1.2

Source: U.S. Energy Information Administration, *International Energy Statistics*

## Qatar LNG exports by destination, 2012

Region	Percent of total
Asia	63%
Europe	30%
other	8%

Source: U.S. Energy Information Administration, *Cedigaz*



## Electricity

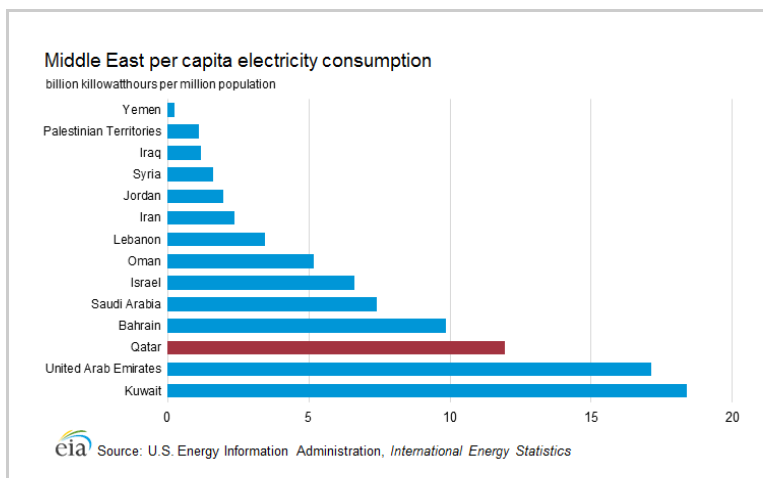
*Despite rising electricity demand, Qatar had a surplus generating capacity of approximately 2.5 gigawatts, or nearly 30%, in 2012.*

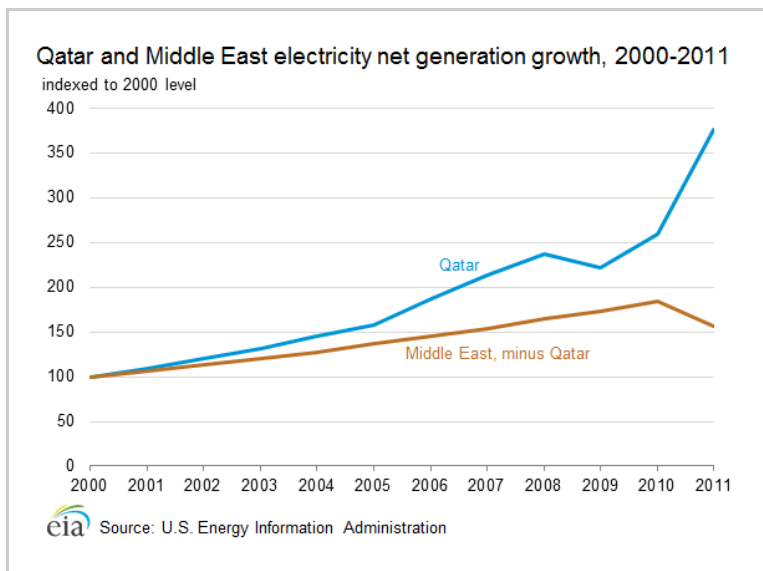
With one of the fastest growing economies in the world over the past few years, energy

demand in Qatar rose significantly, particularly electricity demand. All of Qatar's current generating capacity is natural gas-fired, although there have been some discussions on potential solar power projects over the past several years. Qatar is not currently pursuing coal or nuclear generating capacity.

Between 2000 and 2010, Qatar's electricity consumption grew from approximately 8.0 billion kilowatthours to 20.5 billion kilowatthours. That growth has continued, and Qatar's Minister of Energy and Industry stated that consumption in 2012 grew by an additional 13%.

To meet rising electricity demand, Qatar continues to invest in its generating capacity. Qatar plans to boost generating capacity from between 8.3 and 8.8 gigawatts (GW) in 2012 (according to various estimates) to 15 GW in 2015. Qatar already invested over \$8 billion to expand the country's transmission and distribution networks, and it has budgeted an additional \$4.1 billion for water and power projects between 2012 and 2015. A recent plan, announced in March 2013, proposes to spend \$22 billion on water and power projects between 2014 and 2022, adding 140 new electrical substations and 2.1 MW of generating capacity over the first 5 years of the project.





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## Notes

- Data presented in the text are the most recent available as of January 30, 2014.
  - Data are EIA estimates unless otherwise noted.
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## Sources

- Alwaseeta
- APEX Tanker Data
- The Arab Fund
- Arab Oil & Gas Journal
- BBC World Wide Monitoring
- Bloomberg News
- BP Statistical Review
- Cedigaz
- The Center for Strategic and International Studies
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- The Economist
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- ExxonMobil
- FACTS Energy
- Financial Times
- Gasal
- IHS CERA
- IHS EDIN
- IHS Global Insight
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- NewsBase
- Oil & Gas Journal
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